REMARKS/ARGUMENTS

Claims 1-32 are pending in the application, of which claims 1, 12, 13, 18-21 and 27 are independent claims. Applicants respectfully request reconsideration.

Claim Rejections – 35 USC § 103

Claims 1, 2, 5-8, 12, 13, 15-21, 23-25, 27, 28, 30 and 31 are rejected under 35 USC § 103(a) as being unpatentable over U.S. Patent No. 5,870,378 (hereinafter "Huang") in view of "Narrow-Band Interference Rejection in Orthogonal Multi-carrier Spread-Spectrum Communications" (hereinafter "Fazel"). Applicants respectfully traverse.

Claim 1 recites a method for recovering data transmitted over a wireless communication channel in a multiple-access OFDM-CDMA system. The method comprises: "processing a received signal to provide data samples; transforming the data samples in the frequency domain in accordance with a particular transformation to provide transformed samples; despreading the transformed samples with one or more sets of despreading coefficients to provide despread samples, wherein each set of despreading coefficients is associated with a respective despreading code that corresponds to a spreading code used to spread data prior to transmission and selected from a set of available spreading codes; combining the despread samples for each time interval to provide a demodulated symbol representative of a transmitted OFDM symbol; and decoding demodulated symbols to provide decoded data."

Huang is directed to a Multi-Code (MC) CDMA receiver that uses a FWHT to obtain N data correlator outputs. See col. 6, lines 34-42 of Huang. The receiver of Huang comprises a pilot despreader 1401, a Walsh despreader 1402, correlator registers 1407-1410, and a FWHT unit (which is implemented in the DSP that connects to the DSP bus). See Figure 14 of Huang. The Walsh despreader 1402 despreads the input data with Walsh codes to obtain correlation values. Each correlator register 1407-1410 accumulates correlation values from the Walsh despreader 1402 over N_c/N chips to obtain an intermediate correlator result. See col. 11, lines 18-23 of Huang. The intermediate correlator results are then inputted to the FWHT unit, which processes the intermediate correlator results into the N data correlator outputs. See the discussion of the FWHT unit on col. 9, lines 7-25 of Huang referring to Figure 9, where the hold buffers 903 in Figure 9 correspond to the correlator registers 1407-1410 in Figure 14.

However, Huang does not disclose or suggest transforming data samples in the frequency

domain to obtain transformed samples prior to despreading the transformed samples, as recited in claim 1. Referring to Figures 9 and 14 of Huang, the pilot despreading of Huang (which the Examiner relies upon for transforming the data samples) occurs in the time domain prior to the FWHT unit, which transforms the data from the time domain into the frequency domain. Similarly, in Figure 12, the input data I/Q passes through a pilot despreader 1201 and a Walsh despreader 1202 before arriving at an FWHT unit (the FWHT unit is implemented in the DSP that connects to the DSP bus, see col. 11, lines 1-4 of Huang).

Recognizing that Huang does not teach transforming data samples in the frequency domain prior to despreading the transformed samples, the Examiner relies upon Fazel to overcome this deficiency in Huang. Fazel discloses transforming a received signal in the frequency domain prior to despreading.

However, one of ordinary skilled in the art would not have modified the receiver of Haung in view of Fazel to transform the data samples in the frequency domain prior to despreading the transformed samples. This is because transforming the input data of Haung in the frequency domain prior to despreading would render the FWHT unit of Huang inoperable. The FWHT unit of Huang receives input data in the time domain and transforms the input data from the time domain to the frequency domain. As a result, the FWHT of Huang unit would cease to function if the data were transformed in the frequency domain prior to the FWHT unit because the input data would already be in the frequency domain. Thus, one skilled in the art would not have modified the receiver of Haung to transform the input data in the frequency domain prior to despreading because such a modification would render the FWHT unit of Huang inoperable.

Further, one skilled in the art would not have moved the FWHT unit of Huang prior to the despreading by the Walsh despreader 1402. The intermediate correlator results inputted to the FWHT unit are obtained from despreading the input data. Thus, the input data must be despread prior to the FWHT unit in order to obtain the intermediate correlator results inputted to the FWHT unit.

For at least the reasons given above, Applicants submit that claim 1 is allowable over Huang and Fazel. Independent claims 12, 13, 18-21 and 27 recite features similar to independent claim 1, described above, and are therefore allowable for similar reasons. Because the dependent claims inherit the patentability of their respective independent claims, claims 2-11,

14-17, 22-26, and 28-32 are also allowable over Huang. Applicants request that this rejection be withdrawn and the claims be allowed.

Claims 3, 4, 14 and 29 are rejected under 35 USC § 103(a), as being unpatentable over Huang in view of Fazel in further view of U.S. Publication No. 20040095907 (hereinafter "Agee"). Claims 9-11, 26 and 32 are rejected under 35 USC § 103(a), as being unpatentable over Huang in view of Fazel in further view of U.S. Patent No. 6,038,450 (hereinafter "Brink"). Applicants respectfully traverse these rejections.

As presented above, independent claims 1, 12, 13, 18-21 and 27 are allowable over Huang and Fazel. The addition of Agee and/or Brink does not overcome the deficiencies noted with Huang and Fazel.

With respect to Agee, the Examiner relies on Agee for teaching a Fourier transform and states that a substitution of the FWHT with a Fourier transform is a feasible substitution. See page 2 of the Office Action. Firstly, Applicants direct the Examiner to col. 7, lines 38-46 of Huang which teaches selectively choosing Walsh codes so that a FWHT unit may be used: "We have recognized that by restricting ourselves to properly chosen Walsh codes, we can make use of the construction rule of the Walsh codes and share intermediate correlator results. These intermediate results are stored and used to perform a Fast Walsh-Hadamard Transformation (FWHT). As a result, instead of using N complete complex correlators we only need a single one with a FWHT-postprocessing stage." To substitute the FWHT unit with a Fourier transform would undermine the teachings of Huang as the invention of Huang is centered around selectively choosing Walsh codes so that a FWHT unit may be used. See Summary portion of Huang at col. 1, line 61 – col. 2, line 39 and col. 12, lines 8-38 and the claims in Huang.

Were the Examiner to combine Huang and Agee, Huang would be rendered inoperable because if a Fourier transform were placed in the system of Huang before despreading, Huang would not be able to take advantage of selectively choosing Walsh codes. Also, the FWHT of Huang would cease to function (and be redundant) because the samples would already be transformed into the frequency domain.

With respect to Brink, the Examiner relies on Brink for teaching estimating signal quality. Nowhere does Brink teach or suggest transforming data samples in the frequency domain prior to despreading the transformed samples.

Therefore, the combination of Huang and Fazel with Agee and/or Brink does not make obvious the combination recited in dependent claims 3, 4, 9-11, 14, 26, 29 and 32. Applicants request that this rejection be withdrawn and the claims be allowed.

CONCLUSION

Therefore, for at least the reasons presented above with respect to all of the pending claims subsequent to entry of this response, Applicants assert that all claims are patentably distinct from all of the art of record. All objections and rejections having been addressed, it is respectfully submitted that this application is in condition for allowance and a Notice to that effect is earnestly solicited. If any points remain in issue that the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Charge Statement: For this application, the Commissioner is hereby authorized to charge any required fees or credit any overpayment to Deposit Account 17-0026.

Respectfully submitted,
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Date: December 30, 2008

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